IDAHO BUREAU OF LABORATORIES

IDAHO DEPARTMENT OF HEALTH & WELFARE

LABORATORY CONNECTIONS

SUMMER 2003

PERSPECTIVE

Richard Hudson Ph.D.

West Nile Virus in 2002

Over 4 thousand laboratory positive human cases were reported.

WNV infections resulted in 284 human deaths.

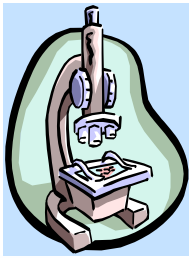
WNV spread from NYC in 1999 to 44 states and the District of Columbia.

Idaho was 1 of 5 states to report only animal (horse) WNV activity.

Since the Spring issue of *Laboratory Connections*, we have been preparing for an increase in West Nile virus activity and evaluating our involvement in influenza surveillance in light of the appearance of Influenza A (H5N1) in Hong Kong and A(H7N7) in the Netherlands. This Lab maintains influenza testing capabilities year-round and is prepared to identify a variety of influenza virus strains including H5N1 and H7N7.

The emergence of Severe Acute Respiratory Syndrome (SARS) raises yet another major public health concern. This Lab will probably be able to identify SARS virus by the time you receive this newsletter. We will keep you informed.

The purpose of this Lab is to perform testing that not only identifies specific agents of disease such as SARS, but also to perform testing that describes the general health and safety of the entire community. This testing includes molecular typing of Salmonella, Enterohemorrhagic *E.coli*, and antimicrobial susceptibility testing. Our work is best accomplished and our purpose best served when we receive specimens and samples from you. Using molecular and traditional techniques, we can provide you with information regarding the nature and extent of nosocomial infections, foodborne outbreaks, and other epidemics. This enables all of us to become prepared to respond to acts of bioterrorism or other public health emergencies.



Surveillance of Shiga Toxin-Producing *E coli* (STEC) alias Enterohemorrhagic *E. coli* (EHEC)

- As many as 50 Shiga toxin-producing serotypes of *E. coli* have been associated with outbreaks.
- Non-O157 isolates account for 36 to 57% of Shiga toxin-producing strains.
- The CDC recommends all stools from persons with diarrhea or HUS be tested for Shiga toxin-producing *E. coli* (STEC).
- STEC infections are often considered to cause bloody diarrhea but one study reported only 27% of specimens were positive for blood. In that study, only 7% of the STEC would have been detected had only bloody specimens alone been cultured.
- Several studies have documented poor recovery of *E. coli O157* from Sorbitol MacConkey agar (SMAC). In those studies >50% of *E. coli O157* would not have been recovered using Sorbitol MacConkey agar (SMAC) alone. SMAC cannot be used for recovery of non-O157 *E. coli* because, unlike *E.coli* O157, they ferment sorbitol.
- Clinically it is difficult to distinguish between STEC and other enteric infections, some of which may be treated with antibiotics. Studies have demonstrated an association between the development of Hemolytic Uremic Syndrome (HUS) and prior antibiotic therapy, especially in children; therefore, testing is important to prevent inappropriate antibiotic therapy.

For the past year this Lab has conducted surveillance testing for STEC on stools reported as negative for enteric pathogens. STEC was detected, using the Meridian EHEC™ kit, in 2% of over 2200 samples tested. Over half of the tests were performed at Eastern Idaho Regional Medical Center as part of their stool testing protocol and the remaining samples were submitted to this Lab by clinical labs throughout the state. STEC serotypes O26, O111, O121, O103, O146 and O145 have been identified in this surveillance program. We wish to thank Eastern Idaho Regional Medical Center and all participating clinical labs as we continue our surveillance for non-O157 STEC in Idaho. If you would like to participate or would like more information about STEC call (208)334-2235 ext. 252.

WEST NILE VIRUS: Human Symptoms

The **incubation period** (i.e., time from infection to onset of disease symptoms) for West Nile encephalitis is usually 3 to 14 days. Most infections are not clinically apparent. It is estimated 20% of the people who become infected will develop West Nile fever and only half of these will visit a doctor.

M**ild symptoms** include fever, headache, and body aches, occasionally with a skin rash on the trunk of the body and swollen lymph glands. Symptoms of mild disease will generally last 3 to 6 days.

The symptoms of **severe infection** (West Nile encephalitis or meningitis) include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness and paralysis. Symptoms of severe disease may last several weeks, although neurological effects may be permanent. Overall, one in 150 infections result in neurological disease with advanced age being the most important risk factor.

Notify your health district or IDHW Office of Epidemiology of any suspected WNV cases.

WEST NILE VIRUS: Human Testing At Idaho Bureau of Laboratories

Sample	Volume	ELISA	Timing of Specimen Collection
CSF	1.0 ml	IgM	ACUTE Phase: 3 to 10 days after onset of symptoms. Note: If an acute sample is taken prior to 10 days post-onset of symptoms, the antibodies may not have developed and a false negative may result, underscoring the importance of collecting paired samples. Convalescent Phase: 2 to 3 weeks after acute sample.
Serum	At least 0.5 ml	IgM IgG	

If the specimen collection occurs within 10 days after the onset of symptoms, a convalescent specimen will be requested from the physician. In most patients, IgM is detectable 8 days **post-onset** of symptoms from a flavivirus infection and persists for at least 45 days and often for 90 days or longer.

Sample Submission

Complete a ***"Virus and Miscellaneous"*** form and include the following information:

- ► Date of onset of illness.
- ► Any pertinent travel history 3 months prior to onset of symptoms.
- ► Date of sample collection.
- ► Brief clinical summary including suspected diagnosis.
- ► History of prior vaccination against flavivirus diseases; eg., yellow fever, Japanese or Central European encephalitis.

For additional information regarding sample submission, contact Vonnita Barton (208) 334-2235 ext. 230.

WEST NILE VIRUS: Bird/Mosquito Testing

- The Idaho Bureau of Laboratories is currently testing birds and mosquito pools by Taqman RT-PCR.
- If you find a dead bird, contact your local health district. Idaho is currently only testing corvids (crows, ravens, jays, magpies) and raptors for WNV as these birds are particularly susceptible to WNV.
- Mosquitoes will be trapped by the seven health districts and six mosquito abatement districts. These mosquitoes will be identified and tested.

Adverse Vaccinia Reaction and Smallpox Collection Kits

Collection kits for Adverse Vaccinia reactions and potential Smallpox cases were sent to all Sentinel (Level A) Laboratories. If you have not received one of the kits or you have questions, please contact Carole Morgan at (208) 334-2235 ext. 250.

- Prior to collecting samples, the proper public health authorities must be contacted. During business hours on weekdays, contact your local health district. After hours, contact the State Communications at 846-7610 (for the Boise calling area) or (800) 632-8000 (long distance).
- The person collecting the sample should have a Vaccinia vaccination within the last three years and wear full barrier protection, including gloves, gowns, and shoe covers. If unvaccinated, the person collecting the sample, must wear a fit tested N95 mask in addition to barrier protection and have no contraindications for vaccination.
- A specialized requisition is included in the kit because samples should be taken from multiple sites. Please include a description of the sites you are sampling (Example: Site 1 is right shoulder, site 2 is right wrist).
- The EM grids will only be used if there is a moderate to strong suspicion of Smallpox. They will **never** be used for Adverse Vaccinia reactions. The EM grid holder contains 2 EM grids. They are small copper disks that are very fragile. Take care not to bend the disks or touch them with your fingers.
- The sample on the plastic slides is used for molecular testing. To avoid cross-contamination, please use the slide holder for a single patient.
- **Be Safe**. Follow safety procedures including proper disposal of protective gear, universal safety precautions, and appropriate personal hygiene.

Idaho Bureau of Laboratories is performing the rapid real-time PCR assay for Vaccinia.

Training Corner

To assist laboratory personnel in meeting the challenges of antimicrobial susceptibility testing and detection of resistance, an interactive educational CD called "Antimicrobial Susceptibility Testing: A self-study program" is now available through the Public Health Training Network. This comprehensive training tool was developed by Fred Tenover, Associate Director for Laboratory Science, Division of Healthcare Quality Promotion, NCID, CDC; Janet Hindler, Clinical Microbiology, UCLA Medical Center; and Eunice Rosner, Health Scientist, Division of Laboratory Systems, Public Health Program Planning Office, CDC.

Continuing education credits are available for each of four modules. CDs can be ordered online from the Association of Public Health Laboratories (www.aphl.org) or by sending an email to ast@aphl.org. Individuals may order one CD at no charge; institutions may order up to three copies at no charge. One CD can be used to train multiple individuals and can be used on multiple computers. Additional AST training resources from CDC are available at http://www.phppo.cdc.gov/dls/master/default.asp

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SARS

Physicians who suspect a case of SARS should contact the local health district epidemiologist, who will provide assistance to determine if the SARS case definition is met, facilitate collection and submission of the specimens to this Lab.

CDC is working to disseminate real time PCR to state laboratories. An ELISA test to detect total antibody is now in place. Respiratory swabs, aspirates, and sputum are the specimens of choice for PCR; serum samples should also be drawn for ELISA serology. It is very important that an acute serum specimen be collected followed by a convalescent specimen 21 days post on-set of illness.

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"PROTECTING THE HEALTH AND ENVIRONMENT OF THE PEOPLE OF IDAHO THROUGH

Coming Fall Issue

INFLUENZA

REFERENCES

SARS http://www.cdc.gov/ncidod/sars or http://www.who.int/csr/sars/en/

WNV http://www2.state.id.us/dhw/cdp/westnile/west_nile_index.htm or http://www.cdc.gov/ncidod/dvbid/westnile/

STEC **Kehl,K.S.** et al. 1997. Evaluation of the Premier EHEC Assay for detection for Shiga toxin-producing *Escherichia coli*. J. Clin. Microbiol. **35**: 2051-2054.

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Novicki, T.J. et al. 2000. Comparison of Sorbitol MacConkey Agar and a two-step method which utilized enzyme-linked immunosorbent assay toxin testing and a chromogenic agar to detect and isolate Enterohemorrhagic *Escherichia coli*. J. Clin., Microbiol. **38**:547-551

Kehl, K.S. 2001. Pediatric Clinical Microbiology: Kids are not just short adults. Clin. Micro. Newsletter. **23**:75-78.

The Idaho Bureau of Laboratories has presented three workshops covering the procedures for "Rule Out of BT Agents" for Sentinel Laboratories (Level A). Laboratory personnel from 24 of the 38 Sentinel Laboratories in the State of Idaho attended these workshops. If you haven't attended, we invite you to join us for Summer 2003 "Dry Lab" Workshop in northern Idaho July 30th or August 28, 2003 for a Wet Workshop in Boise. Watch for a flyer with more details.

Costs associated with this publication are available from the Idaho Department of Health and Welfare. IDHW-600-14015-7/95. Cost per unit $2.60